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Oryctolagus cuniculus, European Rabbit

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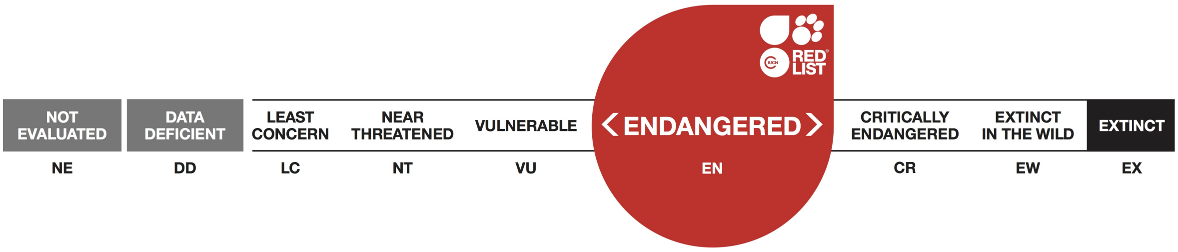

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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Mammalia	Lagomorpha	Leporidae

Taxon Name: *Oryctolagus cuniculus* (Linnaeus, 1758)

Regional Assessments:

- Europe

Common Name(s):

- English: European Rabbit, European Rabbit, European Rabbit
- French: Lapin de garenne, Lapin de garenne, Lapin de garenne
- Spanish: Conejo, Conejo, Conejo

Taxonomic Notes:

The genus *Oryctolagus* appeared in the fossil record (Middle Pliocene) before any other modern leporid genus. *Oryctolgus cuniculus* was widespread across much of the Mediterranean area and central Europe in the Late Pleistocene, but following the maximum glacial period and Early Holocene it became confined to its current range in the Iberian Peninsula and adjoining areas in France (López-Martínez 2008). Two subspecies are recognized: *O. c. cuniculus* and *O. c. algirus.* The latter is only present in the Iberian Peninsula and some islands, while the former occurs in most of the species' introduced range. Based on genetic evidence they have apparently evolved independently beginning approximately 2 mya during the Quaternary glaciations (Ferrand 2008). The independence of these two subspecies has been reinforced by data on parasitology, behavior, reproduction, and morphology (e.g. Gonçalves *et al.* 2002, Ferreira *et al.* 2015). Due to their genetic incompatibilities and reproductive isolation in their zone of contact in the middle of the Iberian Peninsula (e.g. Carneiro *et al.* 2010), some feel that they should be considered separate species (Delibes-Mateos *et al.* 2018). The domesticated rabbit originates from *O. c. cuniculus*.

Assessment Information

Red List Category & Criteria: Endangered A2abce ver 3.1

Year Published: 2019

Date Assessed: August 15, 2018

Justification:

The European Rabbit is a widespread colonizer and is considered a pest outside its natural range, where eradication of the rabbit is priority for conservation (Cooke 2014, Cooke, Flux and Bonino 2018). However, only the natural range of Spain, Portugal, and southern France are considered in this global assessment. Assessment of the European Rabbit is filled with contradictions (Lees and Bell 2008, Delibes-Mateos *et al.* 2011). The European Rabbit is an important game species in Spain, Portugal and France, and the agriculture sector considers the species a pest (not a typical situation for a putatively Threatened species). On the other hand, it is an important ecosystem engineer (Galvez-Bravo *et al.* 2009) and a keystone species within its native range (Delibes-Mateos *et al.* 2008), serving as the dominant prey item for the highly endangered Iberian Lynx (*Lynx pardinus*) and the Spanish Imperial Eagle (*Aquila adalberti*) (Ferrer and Negro 2004). However, from 1950 onwards, the European Rabbit declined dramatically throughout its native range to densities less than 10% of those found earlier in the 20th century mainly due to the irruption of viral diseases (Myxomatosis in the fifties and Rabbit Hemorrhagic disease, RHD, in the nineties), and habitat loss (Moreno *et al.* 2007, Delibes-Mateos *et al.* 2009a, Villafuerte *et al.* 2017). Other factors such as human induced mortality or predation may have played a role in rabbit decline, at least locally. On balance this situation led more than one decade ago to a classification of the European Rabbit as Vulnerable in Spain and Near Threatened in Portugal (Cabral *et al.* 2005, Villafuerte and Delibes-Mateos 2008). In recent years many rabbit populations, particularly in natural habitats, have continued declining (some have even become extirpated), while others, mostly in human-modified landscapes, have increased in numbers leading to an increase in complaints by farmers concerning crop damage caused by rabbits (Delibes-Mateos *et al.* 2014a).

Most recently, beginning after 2010, a new wave of disease (a new variant of RHD virus – GI.2/RHDV2/b) has swept through many rabbit populations causing massive declines. In an area that traditionally held the highest rabbit densities within Doñana National Park (i.e. Coto del Rey) – which thus held a core population of Iberian Lynx – there was a decline of greater than 80% during 2012-2014. In low-density rabbit areas within the park similar declines have been reported (Delibes-Mateos *et al.* 2014b). Rabbit density in the proximity to Yeguas River in Andújar and Cardeña Natural park in southern Spain, where the largest Iberian Lynx population lives, the rabbit density declined from more than 3.5 rabbits/ha in 2010 to less than 1 rabbit/ha in 2013 (a decline of approximately 75%). Also, rabbit abundance decreased by 57% between 2010 and 2014 in 26 localities surveyed in the Córdoba province (southern Spain), only 11% of these populations experienced a positive trend in the study period (Guerrero-Casado *et al.* 2016). The Andalusian government through censuses that started in 2004, has shown that rabbit density has decreased on average by more than 50% in 2016, despite the increase in abundance detected in some agricultural areas, where rabbits have to be controlled to avoid crop damage (www.juntadeandalucia.es). Hunters have similarly noted the decreased abundance of rabbits based on declines of 70-80% in the hunter bags in some estates compared with recent years (Delibes-Mateos *et al.* 2014b). In summary, the recent overall estimated 60-70% decline in populations of European Rabbits over the past decade has been followed by decreases of 65.7% in Iberian Lynx and 45.5% in Spanish Imperial Eagle fecundities (Monterroso *et al.* 2016). These new data lead to a re-evaluation of the previous assessment of the European Rabbit as NT, to EN – Endangered A2abce reflecting that populations have experienced or are experiencing declines mainly due to the recent impact of GI.2/RHDV2/b. The A3 criteria has not been applied because European Rabbits have been known to develop immunity to epizootics of prior viral diseases, it is hoped that a similar recovery will occur following this epizootic.

Previously Published Red List Assessments

2008 – Near Threatened (NT)
http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T41291A10415170.en

1996 – Lower Risk/least concern (LR/lc)

Geographic Range

Range Description:

Original distribution of the European Rabbit after last ice age included Iberian Peninsula (Spain and Portugal) to south-western France and perhaps northern Africa, and the introduction throughout western Europe is thought to have occurred as early as the Roman period (Gibb 1990, Mitchell-Jones *et al*. 1999). Currently the species ranges through all Western European countries, Ireland and the UK (including islands), Austria, parts of Sweden, Poland, the Czech Republic, Hungary, Romania, Ukraine, and Mediterranean islands Sicily, Corsica, Sardinia, Crete, the Balearics (Thompson and King 1994), Croatia, and Slovakia (Mitchell- Jones *et al*. 1999). It was introduced to Australia and New Zealand, where it is now widespread (Thompson and King 1994, Cooke 2014, Cooke, Flux and Bonino 2018). European Rabbits have been introduced to South America multiple times since the fifteenth century, but the species maintains a limited range in Argentina and Chile (Delibes and Delibes-Mateos 2015). European Rabbits have similarly been introduced on over 800 islands throughout the world, giving evidence to the plasticity of the species (Flux and Fullagar 1992, Thompson and King 1994). The European Rabbit occurs in a wide variety of habitats, and it is usually found below 1,500 m in elevation in its native range (Fa *et al*. 1999), although in Tenerife (Canary Islands) it is extremely abundant over 3,000 m (>7.5 rabbits/ha; Cubas *et al.* 2018).

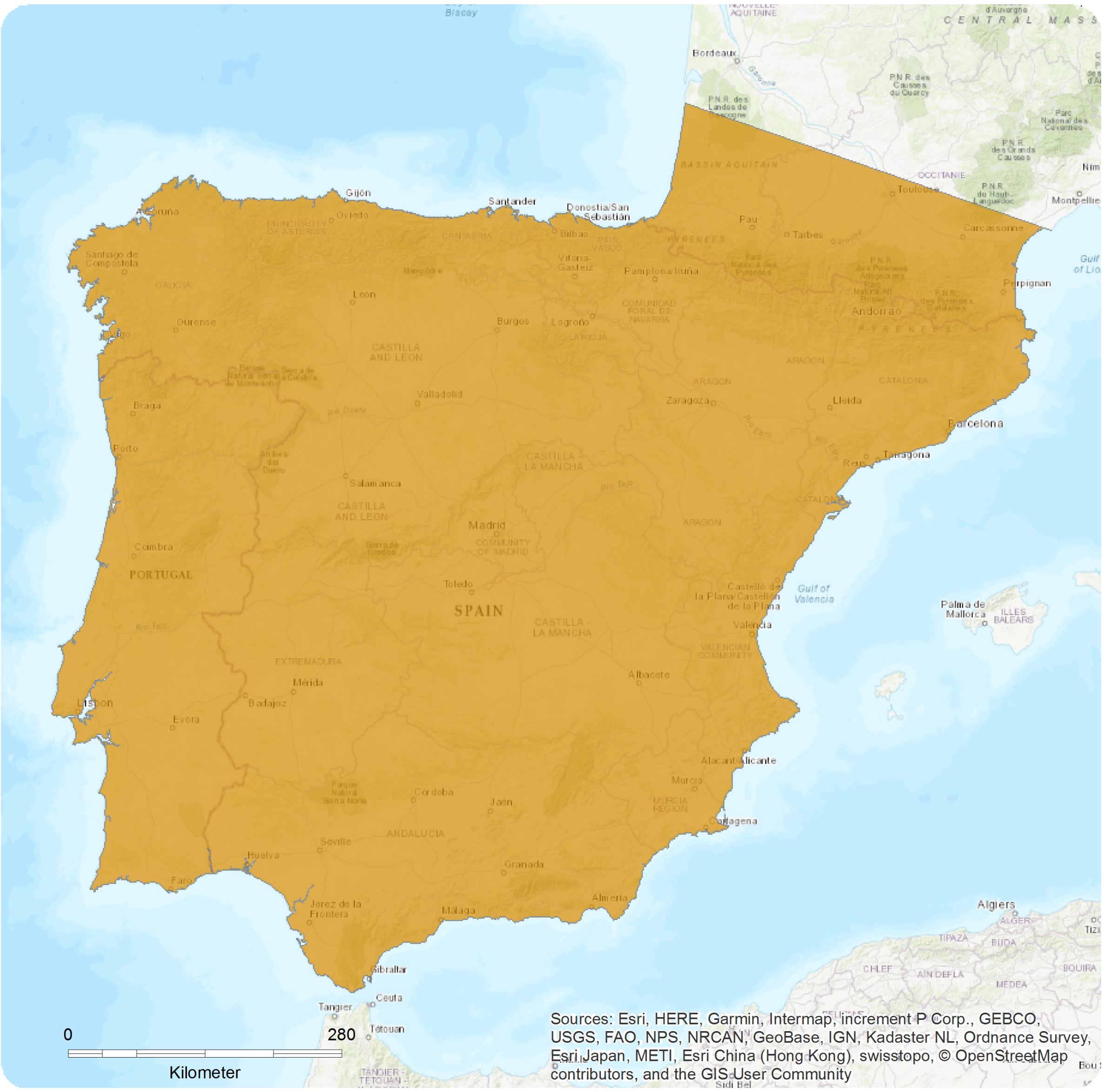
Country Occurrence:

Native: France; Portugal; Spain

Introduced: Albania; Algeria; Australia; Austria; Belgium; Bulgaria; Chile; Croatia; Czechia; Denmark; Germany; Gibraltar; Greece; Hungary; Ireland; Italy; Morocco; Namibia; Netherlands; New Zealand; Norway; Poland; Romania; Russian Federation; Slovakia; South Africa; Sweden; Switzerland; United Kingdom; United States

Distribution Map

Oryctolagus cuniculus

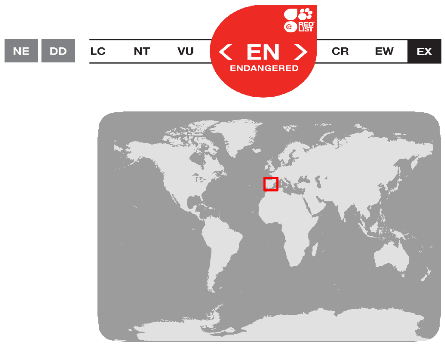


Range

Extant (resident)

Compiled by:

IUCN (International Union for Conservation of Nature)



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

Population

The European Rabbit decline has escalated in recent years. As of 2005, rabbit populations in the Iberian Peninsula had declined to as little as 5-10% of the number from 1950, based on the decrease in Doñana National Park, a protected area (Delibes *et al.* 2000, Moreno *et al.* 2007). Density of rabbits has been recorded at a maximum of 40 per hectare in prime habitat, though the abundance has declined significantly since the arrival of new threats, primarily the spread of viral diseases (myxomatosis and RHD), in the mid-20th century (Delibes-Mateos *et al.* 2009a, Villafuerte *et al.* 2017). In Portugal, a population reduction of 24% was recorded between 1995 and 2002 (Alves and Ferreira 2002), but this decline was much more pronounced previously as a consequence of myxomatosis and RHD outbreaks in the 1950s and late 1980s, respectively. Decline has been uneven across the range, due to varying degrees of threat (Ward 2005, Delibes-Mateos *et al.* 2009a).

Most recently, beginning in 2011-2012, a new wave of disease (a new variant of Rabbit Hemorrhagic Disease virus – GI.2/RHDV2/b) has swept through many rabbit populations causing massive declines. This variant has completely replaced the traditional RHDv strain across Iberia (Calvete *et al.* 2014, Lopes *et al.* 2015), and its drastic effects are evident. In an area that traditionally held the highest rabbit densities within Doñana National Park (i.e. Coto del Rey) – which thus held a core population of Iberian Lynx – there was a decline of greater than 80% during 2012-2014. In low-density rabbit areas within the park similar declines have been reported (Delibes-Mateos *et al.* 2014b). Rabbit density in the proximity to Yeguas River in Andújar and Cardeña National parks in southern Spain, where the largest Iberian Lynx population lives, the rabbit density declined from more than 3.5 rabbits/ha in 2010 to less than 1 rabbit/ha in 2013 (a decline of approximately 75%). Hunters have similarly noted the decreased abundance of rabbits based on declines of 70-80% in the hunter bags in some estates compared with recent years (Delibes-Mateos *et al.* 2014b). Also, rabbit abundance decreased by 57% between 2010 and 2014 in 26 localities surveyed in the Córdoba province (southern Spain), only 11% of these populations experienced a positive trend during the study period (Guerrero-Casado *et al.* 2016). The recent overall estimated 60-70% decline in populations of European Rabbits has been followed by decreases of 65.7% in Iberian Lynx and 45.5% in Spanish Imperial Eagle fecundities (Monterroso *et al.* 2016).

Current Population Trend: Decreasing

Habitat and Ecology (see Appendix for additional information)

The European Rabbit prefers a mixed habitat of Mediterranean oak savanna or scrub-forest, or areas with around 40% cover for shelter from predators and open areas that support their diet of grasses and cereals (Moreno and Villafuerte 1995, Calvete *et al.* 2004). Nevertheless, in the Iberian Peninsula, rabbits are increasingly found at high densities in intensively-managed farmland areas (Barrio *et al.* 2010). The European Rabbit builds warrens in soft soil (Calvete *et al.* 2004), but finds shelter in scrub in rocky areas, though predation risk is higher in above ground dwellings (Villafuerte and Moreno 1997). The natural range of the European Rabbit on the Iberian Peninsula is warm and dry, rarely occurring above 1,500 m (Fa *et al.* 1999). The rabbits are territorial and tend to live and forage in colony groups of up to 20 adults (Mitchell-Jones *et al.* 1999), and are crepuscular (Lombardi *et al.* 2003).

The European Rabbit can breed throughout the year (uncommon in lagomorphs), though this is limited by climate and resource availability (Bell and Webb 1991, Villafuerte *et al.* 1997). They raise altricial

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young between three and six at a time, which leave the warren in under a month (Gibb 1990). Females reach sexual maturity on average in 3.5 months, males in 4 months, and can live up to 9 years (Macdonald and Barrett 2001), though many succumb to predation and other perils much earlier. Up to 75% of young rabbits are killed by predators before they establish a territory (Gibb 1990). Annual mortality is usually higher than 50% (e.g. Cowan 1983, Webb 1991), but it can be highly variable among years, seasons, and habitats (Lombardi *et al.* 2003, Moreno *et al.* 2004). The head-body length is 34-50 mm (Macdonald and Barrett 2001).

The European Rabbit is an ecosystem engineer and a keystone species (Delibes-Mateos *et al.* 2007, Galvez-Bravo *et al.* 2009). The diet of the Iberian Lynx consists of 80-100% rabbits (Delibes *et al.* 2000), the Imperial Eagle consumes 40-80% of its diet in rabbits (Delibes-Mateos *et al.* 2008), and the decline of the European Rabbit has been linked to the near extinction of these two predators (Ferrer and Negro 2004).

The European Rabbit is responsible for landscape modelling that supports vegetation growth typical to Spain and Portugal and creates habitat for wildlife species (e.g. Galvez-Bravo *et al.* 2009). Its presence increases species richness (Delibes-Mateos *et al.* 2008) and increases soil fertility (Willott *et al.* 2000).

Systems: Terrestrial

Use and Trade

This is an important game species. Domesticated forms are important pet animals and are also used in labs for experiments.

Threats (see Appendix for additional information)

The greatest force behind the decline of the European Rabbit has been two diseases that appeared in the 20th century. Myxomatosis is a South American virus, primarily spread by insect (mosquito and flea) vectors, that was intentionally introduced by a farmer in the mid-1950s in France to control the rabbit population (Lavazza and Cooke 2018). An estimated 90% of European Rabbits perished due to myxomatosis after the first outbreaks in the 1950s (Muñoz 1960), after that, the disease became endemic to Iberia, where it currently affects most rabbit populations (Villafuerte *et al.* 2017). After symptom onset, death results in an average of 13 days. Rabbits with the virus are made more vulnerable to predators (Villafuerte *et al.* 1995) and more susceptible to Rabbit Haemorrhagic Disease (RHD; Barnett *et al.* 2018). Juveniles are more susceptible to myxomatosis than adults (Villafuerte *et al.* 2017). Myxomatosis cases peak during early summer to fall (Villafuerte *et al.* 2017).

Rabbit Haemorrhagic Disease is caused by a lagovirus that appeared in Europe in the late 1980’s, initially causing the death of 55-75% of rabbits in the Iberian Peninsula (Villafuerte *et al.* 1995). RHD is primarily spread by direct contact. Death typically results within 24 hours of symptom onset, with a short incubation time of under 48 hours (Villafuerte *et al.* 1995). Adult rabbits are more susceptible to RHD than juveniles (unlike myxomatosis), and RHD is more prevalent in late winter and spring. Global warming may increase disease incidence by creating a warmer, drier climate in Spain and Portugal (Ward 2005).

The new variant of RHD (GI.2/RHD2/b) was originally described in France in 2010, and since 2011-2012 it has caused wide-spread mortality among European Rabbits in Spain (Delibes-Mateos *et al.* 2014b) and Portugal (Monterroso *et al.* 2016). Declines of from 75% - 80% within two years have decimated many populations of European Rabbits – particularly in their native habitat, which coincides with core habitat occupied by Iberian Lynx (Delibes-Mateos *et al.* 20014b, Monterroso *et al.* 2016). The new variant has fully replaced classic RHD strains in Spain and Portugal (Calvete *et al.* 2014, Lopes *et al.* 2015). Unlike classic RHD, the new variant kills young rabbits (Dalton *et al.* 2012, Abrantes *et al.* 2013), compromising population recruitment.

Habitat loss and fragmentation are continuing to cause declines in European Rabbits (Delibes-Mateos *et al.* 2010), which require pastures-crops and scrub- forest vegetation for food and shelter, respectively (Moreno and Villafuerte 1995). Modern intensive agriculture negatively impacts rabbits more than small scale mixed farming, which may have initially increased suitable habitat within the rabbit's natural range (Delibes-Mateos *et al.* 2010). High intensity livestock production and high ungulate numbers contributes to habitat degradation and resource competition (Carpio *et al.* 2014). Fallow farm land often returns to closed forest rather than open scrub, which is not a suitable habitat (Moreno and Villafuerte 1995, Calvete *et al.* 2004). Tree plantations planted in Spain and Portugal have replaced habitat for both rabbits and their predators and urbanization presents a threat as does increased fire danger in existing habitat, and climate change (Ward 2005, Tablado and Revilla 2012).

Exploitation of European Rabbis by humans may have become a threat in some places, especially in the case of populations that are already declining due to other causes, so rabbits cannot sustain hunting and control measures as well as in the past. As an example, in Aragón (northeastern Spain) the strongest negative rabbit population trends were found in areas with high hunting pressure (Williams *et al.* 2007). Farmers and hunters control rabbit populations in farmland areas directly by shooting and trapping (Ríos-Saldaña *et al.* 2010). Farming indirectly causes decline through habitat conversion and excessive pesticide and fertilizer use. Over 70% of Spain is designated as hunting area, and in recent years some hunters have reported a 70% - 80% decline in hunting success due to lower rabbit populations resulting from the new variant of RHDv (Delibes-Mateos *et al.* 2014b).

Future threats to the European Rabbit may include genetically modified versions of the rabbit viruses being developed in Australia to reduce rabbit numbers where the species is a major pest. Unlicensed release of modified viruses to the native range could devastate the remaining populations (Angulo 2001). Finally. the mixture of both subspecies due the restocking of rabbits for hunting or predator conservation purposes, may also become a threat by losing the natural genetic diversity compromising the survival and reproduction in the wild (Piorno *et al.* 2015).

Conservation Actions **(see Appendix for additional information)**

Important Conservation Actions Needed:

Conservation for the European Rabbit was delayed for several decades after their decline became apparent. Efforts began to take shape in the late 1980's due to previous political isolation of its native range and the lack of information on the species as a keystone to Iberian ecosystems. The issue of eradication of European Rabbits from introduced areas (e.g. Australia, New Zealand, and many islands) may have diminished the appearance of rabbit decline in its native range. Increased interest in the specialist predators that depend upon the rabbits and the issue of the sustainability of hunting populations brought the species into the public eye, but failed to address some issues of rabbit conservation, such as its role as an ecosystem modeler and the effects of habitat loss on populations (Gibb 1990, Ward 2005).

Ward's (2005) report was key to highlighting the threats associated with the European Rabbit, and outlined specific goals needed to achieve rabbit recovery:

• Establish rabbit monitoring programs to accurately describe decline directly.

• Create and implement a management plan for rabbit recovery that prioritizes critical ranges and populations. Rabbit management plans started long ago, although they were embedded in the recovery plans of other species, such as the Imperial Eagle or Iberian Lynx. This situation continues in many areas, and this goal attempts to ensure dedicated plans to conserve European Rabbits.

• Programs to limit the incidence and impact of new and existing diseases may be difficult in the wild, though some success has been observed in captive populations. Current vaccines do not confer total immunity to RHD or myxomatosis, have side effects such as increasing rabbit stress and vulnerability to predators, and have short-lived effectiveness. In addition, the need to vaccinate rabbits individually in the field is unmanageable. Any genetically modified live virus vaccine is controversial because of the possibility of unpredictable evolution of the virus, and its potential spread to rabbit populations outside the natural range of European Rabbits where eradication, not conservation, is the objective. Increasing habitat quality may indirectly help rabbit disease resistance given that it is known that high density populations respond better to disease outbreak (Calvete 2006, Cotilla *et al.* 2010, Guerrero-Casado *et al.* 2016). Controlling disease vectors for myxomatosis has not been found to be effective. Preventing the spread of modified immune-contraceptive viruses engineered in Australia to control rabbit fertility may become an issue.

• Reducing hunting impact is not guaranteed to reduce decline because disease effects often outweigh hunting as a threat, and because implementation of restrictions would likely not be realistic given the prevalence of hunting in Iberia, where in many areas their management strategies are even more effective than the ones carried out in some protected areas to enhance rabbit populations (Delibes-Mateos *et al.* 2009b). Revisions to existing hunting seasons have been proposed, but only some small changes have been tested. Probably, a greater distinction between hunting regulations should exist between areas where rabbits are in decline and agricultural areas where the species is damaging crops, in spite that there are more legal facilities to hunt rabbits in the latter. A growing recognition among hunters of the issue of rabbit decline has led to frequent self-restraint (Angulo and Villafuerte 2003). As a very large demographic, hunters could represent a powerful force in maintaining sustainable hunting populations.

• Rabbit populations affected by agriculture represent a sensitive issue, as rabbits are typically seen as a pest and an economic liability for farmers. Despite pressures from environmental groups, many farmers and hunters continue to take measures to reduce rabbit numbers even in agro-forestry areas where the species plays key ecological roles. Awareness among farmers and hunters of rabbit conservation issues is generally low. Government policy allows hunters to control rabbits in farmland areas with permits (Ríos-Saldaña *et al.* 2010), and though crop loss due to rabbit damage in some cases is economically payed through insurance, no requirement of those compensated is made for conservation.

• Halting and reversing habitat loss and fragmentation was aided in the past decades by the establishment of national parks in Spain, but most optimal rabbit habitat is on private land (Delibes-Mateos *et al.* 2009b). A shift from high-intensity farming and monoculture forestry back to mixed agro-forestry and small scale farming would help sustain rabbit populations (Calvete *et al.* 2006, Delibes-Mateos *et al.* 2010). Natura 2000 promotion of sustainable development and EU subsidies supporting environmentally friendly agriculture are promising but underfunded and too new to demonstrate a significant impact. Importantly, land abandonment in mountain regions has resulted in the encroachment of forests and scrubland, which is detrimental for rabbits (Delibes-Mateos *et al.* 2010). In these places, promoting open areas (i.e. pastures or small scale farming) through scrub clearance is essential to increase food availability for rabbits (Moreno and Villafuerte 1995).

• Reintroductions have been a key focus of conservation efforts, with up to 500,000 released annually in Spain and France. The efforts so far have not increased rabbit populations in most cases, due to the unappropriated selection of the animals to be released and increased mortality from predation and inadvertent spread of disease, which may actually have a net negative impact. The flaws in reintroduction practices do not completely negate the importance of the efforts, which have been shown to help sustain predators and hunting populations at least locally (e.g. Rouco *et al.* 2008, Guerrero-Casado *et al.* 2013). The success of reintroductions may be increased by fencing from predators and competitors and preventing short-term dispersal in addition to providing feeding resources (Rouco *et al.* 2008).

• Though rabbit predators have not directly caused rabbit decline, factors that have caused initial decline (e.g. disease, habitat loss) may be exacerbated by some opportunistic predators (Fernández de Simón *et al.* 2015). Game keeping efforts to increase rabbit populations often focus on predator reduction, and sometimes predators of conservation concern are affected because non-selective practices are used (e.g. cage-trapping or poisoning). Efforts could be more productively focused on increasing habitat protection (e.g. building artificial rabbit warrens), reduction of rabbit mortality by humans (hunting, inappropriate management practices) and reducing disease impacts.

The importance of the European Rabbit within its natural range requires that it be considered for listing in spite of its global abundance. In its original range it is a keystone to the Mediterranean ecosystem, as prey for specialist predators (Virgos *et al.* 2005, Delibes-Mateos *et al.* 2008) and as a landscape modeler (Galvez-Bravo *et al.* 2009, Delibes-Mateos *et al.* 2008). It is an important game species in Spain and Portugal (Delibes-Mateos *et al.* 2014a).

Credits

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Reviewer(s): Smith, A.T.

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External Resources

For Images and External Links to Additional Information, please see the Red List website.

Appendix

Habitats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
1. Forest -> 1.4. Forest - Temperate	-	Marginal	-
1. Forest -> 1.5. Forest - Subtropical/Tropical Dry	-	Marginal	-
2. Savanna -> 2.1. Savanna - Dry	-	Suitable	-
3. Shrubland -> 3.4. Shrubland - Temperate	-	Marginal	-
3. Shrubland -> 3.5. Shrubland - Subtropical/Tropical Dry	-	Marginal	-
3. Shrubland -> 3.8. Shrubland - Mediterranean-type Shrubby Vegetation	-	Suitable	-
4. Grassland -> 4.4. Grassland - Temperate	-	Suitable	-
4. Grassland -> 4.5. Grassland - Subtropical/Tropical Dry	-	Marginal	-
14. Artificial/Terrestrial -> 14.1. Artificial/Terrestrial - Arable Land	-	Suitable	-
14. Artificial/Terrestrial -> 14.2. Artificial/Terrestrial - Pastureland	-	Suitable	-

Threats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score
11. Climate change & severe weather -> 11.1. Habitat shifting & alteration	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
2. Agriculture & aquaculture -> 2.2. Wood & pulp plantations -> 2.2.2. Agro-industry plantations	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.1. Nomadic grazing	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.3. Agro-industry grazing, ranching or farming	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		

5. Biological resource use -> 5.1. Hunting & trapping terrestrial animals -> 5.1.1. Intentional use (species is the target)	Ongoing	-	-	-
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.1. Hunting & trapping terrestrial animals -> 5.1.3. Persecution/control	Ongoing	-	-	-
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
7. Natural system modifications -> 7.1. Fire & fire suppression -> 7.1.3. Trend Unknown/Unrecorded	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.1. Unspecified species	Ongoing	-	-	-
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
8. Invasive and other problematic species, genes & diseases -> 8.6. Diseases of unknown cause	Ongoing	-	-	-
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
9. Pollution -> 9.3. Agricultural & forestry effluents -> 9.3.4. Type Unknown/Unrecorded	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		

Conservation Actions in Place

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions in Place
In-Place Research, Monitoring and Planning
Action Recovery plan: Yes
In-Place Land/Water Protection and Management
Occur in at least one PA: Yes

Research Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Research Needed
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.5. Threats
1. Research -> 1.6. Actions
2. Conservation Planning -> 2.1. Species Action/Recovery Plan
3. Monitoring -> 3.1. Population trends

Additional Data Fields

Distribution
Estimated extent of occurrence (EOO) (km²): 756308
Lower elevation limit (m): 0
Upper elevation limit (m): 3000
Population
Extreme fluctuations: No
Habitats and Ecology
Generation Length (years): 4.15

The IUCN Red List Partnership

The IUCN Red List of Threatened Species™ is produced and managed by the IUCN Global Species Programme, the IUCN Species Survival Commission (SSC) and The IUCN Red List Partnership.

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